APPLICATION UNDER UNITED STATES PATENT LAWS

Invention: **UNIVERSAL MAIL WIRELESS EMAIL READER**

Inventor(s):   Richard SMITH; and
               Milan RAMI

Manelli Denison & Selter PLLC
2000 M Street, N.W.
Suite 700
Washington, D.C. 20036-2396
Attorneys
Telephone: (202) 261-1000

This is a:

[ ]   Provisional Application

[X]   Regular Utility Application

[ ]   Continuing Application

[ ]   PCT National Phase Application

[ ]   Design Application

[ ]   Reissue Application

[ ]   Plant Application

SPECIFICATION

UNIVERSAL MAIL WIRELESS E-MAIL READER

BACKGROUND OF THE INVENTION

1. Field of the Invention

5   This invention relates generally to electronic mail. More particularly, it relates to an efficient integration of multiple electronic mail accounts for viewing by the user from a single application.

2. Background of Related Art

10   At the current time, most email accounts are accessed via a wired device such as a personal computer (PC) based client, or via an HTML web page.

In today's world, as more and more people develop an on-line presence, people leverage the use of multiple electronic mail

15   accounts. For instance, a particular user might have one electronic mail (email) account from their Internet Service Provider (ISP), another mail account with a web-page based source such as YAHOO or RAGINGBULL, and yet another mail account associated with their business.

20   Conventionally, a user must access each of these mail accounts using a separately configured mail program.

Using a wireless device, retrieval of email is substantially more limited. Some conventional applications offer 'web-clipping' as a means of retrieving email information and transmitting it to a wireless

25   device. However, wireless devices typically utilize a proprietary application programming interfaces allowing retrieval of email from a single source, e.g., from their ISP, or in any event allow retrieval of mail from a single mail account .

There is a need for a technique and architecture which allows easier access to multiple mail accounts, even from a wireless device.

5   **SUMMARY OF THE INVENTION**

In accordance with the principles of the present invention, a universal mail module comprises a plurality of email account information files relating to a corresponding plurality of email accounts of a wireless subscriber. An email agent is in communication with the plurality of email

10   account information files. The email agent maintains a logged-in condition with at least two of the plurality of email accounts. A selection module accepts a selection of one of the plurality of logged-in email accounts for transfer of file information, whereby a wireless subscriber may move back and forth between access to each of a plurality of email accounts without

15   requiring repeated login/logout of any of the email accounts by the wireless subscriber.

A method for allowing a wireless subscriber to move access back and forth between a plurality of different email accounts in accordance with another aspect of the present invention comprises

20   configuring local email account information identifying each of the plurality of different email accounts to a universal mail application. A logged-in condition is maintained with each of the plurality of different email accounts by the universal mail application. Access is provided to the wireless subscriber to any one of the plurality of different email accounts

25   at any time based on a real-time selection made by the wireless subscriber, whereby a wireless subscriber is allowed to move back and forth between each of a plurality of email accounts without requiring repeated login/logout in any of the email accounts.

2

BRIEF DESCRIPTION OF THE DRAWINGS

Features and advantages of the present invention will become apparent to those skilled in the art from the following description with reference to the drawings, in which:

5   Fig. 1 is a block diagram showing a universal mail application in a wireless network, in accordance with the principles of the present invention.

Figs. 2A and 2B show an exemplary representation of a main interface of the universal mail application (Umail/MoMail), and a

10   sample main menu, respectively, in accordance with the principles of the present invention.

Figs. 3A and 3B show an exemplary message view option and a sample of the message options menu, in accordance with the principles of the present invention.

15   Fig. 4 shows a high-level sequence diagram of an exemplary design interfaces for a UMail/MoMail application, in accordance with the principles of the present invention.

Fig. 5 shows an exemplary class hierarchy of an embodiment of a universal mail application in accordance with the

20   principles of the present invention.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

The present invention relates to a universal mail application for wireless device application which allows a user the ability to access

25   and view email messages from a personal email account using Internet Message Access Protocol (IMAP).

The universal mail application preferably includes multiple front-end user interfaces from WAP and HDML for installation on relevant wireless devices, e.g., on a PQA for PDA software, or on a standard

30   HTML interface.

3

The universal mail application preferably allows a user access to any supported email accounts, with the ability to easily jump from account to account, view message headers, retrieve specific messages only, delete messages, perform flexible folder searches, reply to messages or send new messages. The universal mail application focuses on a separation of application functionality from presentation or the actual type of wireless device form so as not to be restricted to a single type of wireless device.

Fig. 1 is a block diagram showing a universal mail application in a wireless network, in accordance with the principles of the present invention.

In particular, as shown in Fig. 1, a universal mail application **100** operates on an appropriate element of a wireless network **160**, e.g., on a Wireless Internet Gateway (WIG), other gateway element, or as an independent standalone application.

An exemplary Wireless Internet Gateway is shown and described in U.S. Appl. No. 09/630,762, filed August 2, 2000, entitled "Wireless Internet Gateway", by Richard Smith, the entirety of which is expressly incorporated herein by reference.

The universal mail application **100** importantly is in communication with a plurality of email applications **170-172** for any one subscriber. The email applications **170-172** are defined and identified by appropriate parameters stored in corresponding email account information files **140-142** maintained separately for each subscriber. The universal mail application **100** is in communication with a wireless network **160**, which communicates with numerous wireless devices (e.g., subscriber **190**).

One email account information file **140** is designated as a default email account for a particular subscriber **190**. Thus, on activation or other suitable event (e.g., upon initial activation of the mobile device),

4

the email application selected for presentation to the subscriber **190** is the particular email account identified in the default email account information file **140**.

The email account information files **140-142** maintain all necessary information to identify a particular email account, e.g., a POP account number, a server address, an IP address, etc. (In accordance with the principles of the present invention, multiple email account information files may be maintained for any one subscriber.

Optionally, multiple sets of email application files **150-152** corresponding to the multiple email accounts **170-172** may be maintained local to the universal mail application **100**, but preferably multiple email sessions are maintained by the multiple email account compilation module **120** negating the need to maintain local 'copies' of email files. The optional email application files **150-152** may contain downloaded and uploaded message files from the respective email application program **170-172**.

A multiple email account compilation module **120** communicates with the respective email application programs **170-172**, downloading and/or uploading email message files with respect to a particular subscriber at any suitable time. For efficiency purposes from a network perspective, the multiple email account compilation module **120** may be restricted or throttled back to send/receive email from the relevant email application programs **170-172** only during desirable times (e.g., during non-peak hours), either on a system wide basis or on a per-subscriber (e.g., class of service) basis.

The email application files **150-152** maintain the relevant file folders (e.g., Inbox, Outbox, Sent items, Deleted items, Drafts as in a Microsoft OUTLOOK EXPRESS™ format) for perusal by the relevant subscriber **190**. In the shown embodiments, the subscriber **190** is

prompted on their mobile display **195** for selection of any one of the email accounts at any one time.

For instance, in the given embodiments, a menu is established and shown on the mobile device display **195** asking for the

5   subscriber to select one of their email accounts for current perusal using, e.g., the up and down arrow keys as well as the enter key on their keypad **197**.

Importantly, use of a multiple email account compilation module in a wireless network servicing wireless subscribers in accordance

10   with the principles of the present invention allows a user to move easily and quickly from one email account to another without logging out of the last email account and logging into the new email account. Rather, the multiple email account compilation module maintains login with the relevant email applications **170-172**, either real-time or periodically.

15   Figs. 2A and 2B show an exemplary representation of a main display interface of the universal mail application (Umail) **100**, and a sample main menu, respectively, in accordance with the principles of the present invention.

In particular, as shown in Figs. 2A and 2B, a user of a

20   wireless device **190** is allowed to select which account configuration to access (e.g., **140/150** or **142/152**) via an appropriate select menu.

Initially, mobile device users configure all relevant configuration information in the relevant email account information files **140-142** with respect to each of their various mail accounts **170-172**. The

25   users various mail account information for the various mail accounts may be stored, e.g., in a suitable database.

The user's various mail account information files **140-142** preferably include one email account designated as a default email account for that particular subscriber **190**. Upon startup of the wireless

30   device **190**, the universal mail application **100** may configure itself for

access to the user's default mail account **140/170**. Then, as desired by the user, any one of the multiple alternative mail accounts **170-172** may be accessed at will by the wireless device user.

As is seen in the main menu interface shown in Figs. 2A and 2B, the user is able to scroll through a main menu on the display **195** and select a desired option. In particular, after a successful login as shown in Fig. 2A, the user may select using arrow keys and selection keys **210-240** from a plurality of exemplary actions shown in Fig. 2B, including: 1) Change Mail Account, 2) List Folders, 3) List Message Header, 4) Search Folder 5) Send a New Message, and 6) Logout.

Change Mail Account: As a first exemplary option for the user, the user may "change mail accounts". By changing mail accounts, the user of a wireless device may switch between mail accounts by easily selecting a particular mail account as an active email account.

List Folders: The user mail list the account's different folders (e.g., Inbox, Outbox, Sent Items, Deleted Items, Drafts, etc.).

List Message Header: The user may list the relevant message headers (e.g., From, Subject, etc.) for each message in the 'Inbox' (or other selected folder) of the currently active email account.

If the user selected the 'List Message Headers' option, there may be another scrollable list of the current messages from which the user would be able to select a specific message to retrieve. This allows the user to save in terms of time and bandwidth since only specifically chosen messages are transmitted for display.

From the body to the message, the user then has several options. For instance, the user can simply close the message, delete the message, reply to the message or display the next message.

Search Folder: A user may perform a text-based search operation of the current active folder. This search can be elected to be based on sender names, subject, body text or all of the above. The

7

search would return all a summary list of all messages matching the search criteria.

Send a New Message: A user may send a new mail
5   message using the currently selected mail account.

Logout: The user may of course logout or exit the universal mail application as they desire.

Figs. 3A and 3B show an exemplary message view option and a sample of the message options menu, in accordance with the
10 principles of the present invention.

In particular, as shown in Figs. 3A and 3B, if the user selects to 'Send a New Message' from the main menu shown on the display **195** of their wireless device **190**, then the universal mail application **100** may prompt the user for appropriate input. For instance, the user will be
15 prompted for an appropriate 'To' email address, a subject, and/or a short text body.

In the disclosed embodiment, a confirmation of the transmission of the email is provided, then the user is returned to the main menu presented by the universal mail application **100**.
20 The email account files **150-152** need not necessarily be maintained in the universal mail application. For instance, it is preferred that the multiple email account compilation module **120** merely maintain a logged in status with the multiple email accounts for a particular subscriber, and any file requests be forwarded from the subscriber **190** to
25 the email application **170-172** via the multiple email account compilation module **120**.

For instance, Fig. 4 shows a high-level sequence diagram of an exemplary design interface for a universal mail application implemented in a wireless application protocol (WAP) gateway, in
30 accordance with the principles of the present invention.

8

In particular, as shown in Fig. 4, Wireless Application Protocol (WAP) may be implemented. If so, then Wireless Markup Language (WML) and references to WMLScripts are preferably utilized to perform the operations of the universal mail application.

5   As another example, common gateway interface (CGI) scripts may be implemented to receive the relevant information, which may then create WML decks for displaying the results. Most other interfaces such as HDML, HTML or PQA may require a servlet type or Java Server Page (JSP) based interface for remote access and 10 processing.

As shown in message 1 of Fig. 4, a subscriber **190** initially sets up the initial email account information in the relevant email account information files **140-142**, e.g., using suitable display prompting, using customer service representative over the telephone, using a PC 15 application interface, etc.

Message 1.1 shows confirmation of the input/updated email account information in any or all of the relevant email account information file(s) **140-142**.

Message 2 shows email account validation passing from the 20 subscriber's mobile device **190** to the relevant email account information file **140** or **142**. The compilation module **120** passes, in message 2.1, a gateway protocol request message to the Wireless Internet Gateway **410**.

Message 2.1.1 passes email server requests in HTTP format to the relevant email server **400** (not shown in Fig. 1 for simplicity of 25 description), which in turn accesses the relevant email application **170-172** as shown in message 2.1.1.1.

In return message 2.1.1.1.1, email account information is passed from the relevant remote email application program **170-172** back to the internet email server **400**, which responds using HTTP protocol to 30 the Wireless Internet Gateway/ MoMail server **410** (Message 2.1.1.2).

9

In message 2.1.1.2.1, the Wireless Internet Gateway/MoMail **410** appropriately formats the response email information into display code, and passes the same on to the email compilation module **120** in the universal mail application **100**. The email is forwarded to the subscriber where it is appropriately displayed on the display **195**, as depicted in Message 2.2 of Fig. 4.

Fig. 5 shows an exemplary class hierarchy of an embodiment of a universal mail application **100** in accordance with the principles of the present invention.

In particular, specific classes shown in Fig. 5 are described herein below with respect to their function and the role they play.

UMailHandler: This is the primary interface class for the UMail application **100**. This class, or some derivation of this class, preferably provides high-level functionality to the user interface of the wireless device **190**.

As disclosed, this class has a SessionManager object to control and maintain multiple UMail sessions as well as a UMailDatabase object to perform user login verification.

IRemoteHandler: This class extends java.rmi.Remote and offers a remote interface to active servlets. This objects provides the same functionality as the UMailHandler class, but allows calls to be made remotely.

UMailRemoteHandler: This class is derived from the UMailHandler class and implements the remote interface class. This is the RMI implementation class for RMI interfaces.

SessionManager: This class maintains a java Hashtable of all of the active Umail sessions. This class provides the ability to add a new Umail session, remove a Umail session, and/or access or increment a session ID counter.

UMailDatabase: This class handles all of the database interfaces for the UMail application. It provides the ability to create a connection to the database, access information, and provides all of the relevant users' configuration information to the Umail application **100**.

5   **UMailSession:** This is the object which is created by the SessionManager. Each UMailSession object is associated with a specific session identification number (SID). Each object contains a UserInfo object for all configuration information, a list of current folders available and all of the current folder properties (which by default may be, e.g., the

10   account 'Inbox').

This class provides the ability to switch accounts, to retrieve a list of message headers, to determine number of messages information, or to retrieve a specific message for viewing.

UserInfo: This object contains an array of EmailAccount

15   objects and all of the information associated with the currently active email accounts.

EmailAccount: Each instance of this class maintains account provisioning information for a single configured account. Basically, this includes, e.g., a username, a password, and an IMAP host

20   name for the account.

This information is used when switching from one email account to another, and is initialized with database information upon creation.

UMailFolder: This class contains the name assigned to the

25   account, and an array of UMailMessage objects representing each of the messages in the account 'Inbox'. The class provides the means to access a specific message object, retrieve a number of new messages, determine a total number of messages, and/or to delete a specific message from the folder.

UMailMessage: This class is a representation of an actual email message. The object contains a UMailMsgHeader object, a message ID, and the body of the message it represents.

UMailMsgHeader: This class contains only the header information for a message. This includes, e.g., the 'from' string, the 'subject' string, and the 'date' string.

UMailException: This class is an extension of the java exception class. It defines and handles specific UMail exceptions.

UMailRemote_Client: This is the client object for a simple RMI implementation. It provides a simple command menu interface to the UMail application **100**.

UMailRemote_Server: This is the server object for a simple RMI implementation. This is a very simple main which simply creates a UMailRemoteHandler object for the client to interface with remotely. The creation of the UMailRemoteHandler object automatically performs name binding into the rmiregistry to allow a remote client the ability to find the remote object.

UMailTestDriver: This is a simple local stand-alone application main for the UMail application **100**. This is the main driver program which was used during testing and development of the core application.

While the invention has been described with reference to the exemplary embodiments thereof, those skilled in the art will be able to make various modifications to the described embodiments of the invention without departing from the true spirit and scope of the invention.

12